REMARKS

The application has been amended and is believed to be in condition for allowance.

Claims 12-20 are new. Claim 1 has been amended.

Claims 1, 2, 4, 5, 7, 8, 10, and 11 stand rejected as obvious over KAGOHASHI et al. 6,168,752 in view of KOMAGATA et al. 5,714,238.

Claims 3, 6, 9, and 12 stand rejected as obvious over KAGOHASHI et al. in view of KOMAGATA et al. and IRI et al. 5,272,223.

The dependent claims are believed allowable at least for depending from an allowable independent claim.

Further, independent claim 1 is believed to be non-obvious.

The Official Action acknowledges that the prior art would not be modified for the reasons of the present invention. See lines 6-14 of page 5 of the Official Action.

The independent claims now recite not only the use of a phosphate compound, a phosphite compound or a hypophosphite compound, but also recite using a conductive paste comprising surface-modified nickel fine powder (having an average particle size of not more than 5 μm) in which the surface of metal nickel fine particles is modified with in an amount of the phosphate compound, the phosphite compound or the hypophosphite compound

selected to improve resistance to heat shrinkage of the electrode during capacitor manufacture.

There is no teaching in this regard in the prior art. There is no teaching to select an amount of the phosphate compound, the phosphite compound or the hypophosphite compound to improve resistance to heat shrinkage during capacitor manufacture. Thus, even if there is some incidental improvement to heat shrinkage in the proposed combination of the Official Action, there is no teaching to select an amount of the phosphate compound, the phosphite compound or the hypophosphite compound to improve resistance to heat shrinkage during capacitor manufacture.

Accordingly, the combinations suggested by the Official Action do not render obvious the pending claims.

The new claims are similarly believed to be allowable.

Even if the combination of the Official Action were obvious, there is no teaching of controlling a rate of heat shrinkage during manufacture of an internal electrode of a multilayer ceramic capacitor by printing an internal electrode on a ceramic substrate using a conductive paste comprising surface-modified nickel fine powder having an average particle size of not more than 5 μm in which a surface of metal nickel fine particles is modified with a phosphate compound, a phosphite compound or a hypophosphite compound in an amount selected to

improve resistance to heat shrinkage of the electrode during capacitor manufacture by inhibiting a generation of any delamination and cracks in the electrode during manufacture of the ceramic capacitor (claim 13).

Also, applicants do not see any teaching of the conductive paste having been modified to have the resistance to heat shrinkage to be close to a resistance of heat shrinkage of the ceramic substrate of the ceramic capacitor or about equal to a resistance of heat shrinkage of the ceramic substrate of the ceramic capacitor (claims 14-15).

Also, claims 16-17 are believed non-obvious, e.g., a further step of modifying the surface of the nickel fine powder by immersing the nickel fine powder in a solution containing the phosphate compound, the phosphite compound or the hypophosphite compound dissolved therein to have the surface of the fine powder fully adapted to the solution, and the further steps of 1) removing excess solution from the immersed metal nickel fine powder by filtration under reduced pressure; and 2) drying the immersed fine powder after removing the excess solution.

Claim 18 is independent. The prior art is not believed to render obvious the recitation of a method of controlling a rate of heat shrinkage during manufacture of an internal electrode of a multilayer ceramic capacitor, by immersing a nickel fine powder in a solution having an amount of a phosphate

compound, a phosphite compound or a hypophosphite compound to surface modify the nickel fine powder selected to improve resistance to heat shrinkage during capacitor manufacture by inhibiting a generation of any delamination and cracks in the manufacture of the ceramic capacitor.

See claim 19 reciting that the immersion step is selected to result in the surface-modified nickel fine powder having a sharp heat shrinkage-initiating temperature shifted to not less than 900° C. This is not seen in the prior art.

Thus, the pending claims are believed patentable.

For at least these reasons, applicants believe that the pending obviousness rejections are not viable. Accordingly, for the below-noted reasons, reconsideration and allowance of all the pending claims are respectfully requested.

As previously urged, KAGOHASHI et al. do not disclose that nickel powders, being used to make internal electrodes of the disclosed ceramic capacitors, are surface-modified with a phosphate compound, a phosphite compound, or a hydrophosphite compound (as recited by claim 1) or in an amount ranging from 0.01 to 1% by weight (as recited by dependent claims 7-12).

For these missing recited features of the present invention, the Official Action offered KOMAGATA et al.

KOMAGATA et al. is said to disclose "a conductive adhesive paste comprising conductive particles of nickel or

nickel alloy surface treated with a phosphate derivative such as a phosphoric acid ester. The surface treatment is applied to the nickel particles in order to prevent increasing a relative resistivity (specific resistance) by oxidation of the metal particles at a high temperature (Column 1, lines 66-67, Column 2, lines 1-6 and Column 3, lines 21-28). The amount of the surface treating agent is 0.1 to 5% by weight ... (Column 4, lines 60-67)."

The Official Action reasons that it would have been obvious to add a phosphate acid ester surface treatment to the surface of the nickel powders taught by KAGOHASHI et al. given that KOMAGATA et al. teach that doing so prevents an increase in the relative resistivity of the metal particles as high temperature. But this is not what is currently being recited.

KAGOHASHI et al. fairly disclose "Conductive metallic powders such as Ni, Cu and Ag are useful for internal electrodes of multi-layer ceramic capacitors, particularly, Ni powders are recently closed up for such uses. Of those powders, ultrafine Ni powders produced by a chemical vapor deposition are known to be promising. According to a tendency of smaller size and larger capacity in capacitors, internal electrodes are required to be thin and have low resistance, whereby ultrafine powders of diameters of not only 1 μm or less, but also 0.5 μm or less are required." (col. 1, lines 14-23). But, as acknowledged, KAGOHASHI et al. do not disclose "the nickel powders used to make

the internal electrodes of the ceramic capacitors are surface-modified with a phosphate compound, a phosphite compound or a hydrophosphite compound."

KOMAGATA et al. fairly disclose "the conductive adhesive of the present invention comprises (A) conductive particles having a surface of at least one of nickel and nickel-boron alloy, and the surface of which has been subjected to surface treatment with a mixture of a polyoxyalkylene phosphate derivative and a polyoxyalkylene-alkyl (or alkenyl) amine or a derivative thereof (col. 1, line 66 to col. 2, line 6) and "One of the characteristic features of the present invention is to apply a surface treatment to the metal particles with a surface treating agent comprising a mixture of a polyoxyalkylene phosphate (i.e., phosphoric acid ester) derivative and a polyoxyalkylenealkyl (or alkenyl) amine or a derivative thereof in order to prevent increasing a relative resistivity (specific resistance) by oxidation of the metal particles at a high temperature." (col. 3, lines 21-28).

KOMAGATA et al. disclose "to apply a surface treatment to the metal particles with a surface treating agent" in order "to prevent increasing a relative resistivity (specific resistance) by oxidation of the metal particles at a high temperature." For achieving this purpose, it is indispensable to use "a mixture of a polyoxyalkylene phosphate (i.e., phosphoric

acid ester) derivative and a polyoxyalkylenealkyl (or alkenyl) amine or a derivative thereof", that is to say, to use "a polyoxyalkylenealkyl (or alkenyl) amine or a derivative thereof" together with "a polyoxyalkylene phosphate (i.e., phosphoric acid ester) derivative." However, see column 1, beginning with line 45. There it is disclosed that the application of this surface treatment is to provide a conductive adhesive to adhere components to a PC board. That is, the adhesive is not taught for an internal electrode use, which is what the claims recite.

The purpose of the present invention, as currently recited, is to provide "nickel fine powder having a controlled rate of heat shrinkage, which is excellent in resistance to heat shrinkage and which can therefore inhibit the generation of any delamination and cracks in the manufacture of high capacitance multi-layered ceramic capacitors" as seen from the descriptions on page 1, lines 4-12; page 2, line 6 from the bottom to page 3, line 3; page 3, line 12 to line 2 from the bottom; page 11, lines 1-6; and page 11, lines 7-15, and for achieving this purpose, it is indispensable that the surface of the metal nickel fine particles is modified with a phosphate compound, a phosphite compound or hypophosphite compound.

This invention addresses, and the claims recite, a treatment to internal electrodes of a multi-layer ceramic capacitor. KOMAGATA et al. neither disclose nor suggest to use

the conductive adhesive in making an internal electrode of a multi-layer ceramic capacitor. There is no motivation to use the material of KOMAGATA et al. for this purpose, i.e., to this structure.

As will be seen from the above description, the purpose and point of use of "surface-modification" and the constitution of the invention are different in the present invention and the invention of KOMAGATA et al. Therefore, claims 1, 2, 4, 5, 7, 8, 10 and 11 should not be rejected under 35 USC 103(a) as being unpatentable over KAGOHASHI et al. in view of KOMAGATA et al. as the features are non-obvious.

In the invention of IRI et al, "the addition of a coupling agent to the composite metal powder composition" is carried out in order "to improve performance such as, for example, adhesion, water resistance, hot water resistance, chipping resistance and the like of the coating obtained from a paint containing the composite metal powder composition," as described at column 10, lines 20-29.

Whereas, the present invention provides "nickel fine powder having a controlled rate of heat shrinkage, which is excellent in resistance to heat shrinkage and which can therefore inhibit the generation of any delamination and cracks in the manufacture of high capacitance multi-layered ceramic capacitors" as described above and for achieving this purpose, it is

indispensable that the surface of the metal nickel fine particles used in the internal electrode be modified with a phosphate compound, a phosphite compound or hypophosphite compound.

IRI et al. neither disclose nor suggest to use the conductive adhesive in making an internal electrode of a multi-layer ceramic capacitor.

As will be seen from the above description, the purpose and effect of using "coupling agent" are different in the present invention and the invention of IRI et al. Therefore, claims 3, 6, 9 and 12 should not be rejected under 35 USC 103(a) as being unpatentable over KAGOHASHI et al. in view of KOMAGATA et al. and IRI et al.

Thus, even if the materials disclosed in the applied references meet the recitations of the pending claims, there is no motivation to use these materials for the structure recited. Absent such motivation, the obviousness rejections are not viable.

In view of the above, applicants believe the present application is in condition for allowance and an early indication of the same is respectfully requested.

Reconsideration and allowance of the pending claims are therefore respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any

overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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